

LISTING OF THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

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Claim 1 (Previously presented)      A system for helping to protect a vehicle occupant, said system comprising:

        a crash sensor operative to sense a vehicle crash event and provide a crash signal having a characteristic indicative of the sensed crash event;

        an acoustic safing sensor operative to sense acoustic waves propagating through the vehicle structure during a vehicle crash event and provide a safing signal having a characteristic indicative of the sensed crash event;

        an actuatable occupant protection device for, when actuated, helping to protect the vehicle occupant during a vehicle crash event; and

        a controller which controls actuation of said occupant protection device in response to both said crash signal and said safing signal separately indicating the occurrence of a deployment crash event.

Claim 2 (Original)      A system as set forth in claim 1 wherein said crash sensor is an accelerometer.


Claim 3 (Original) A system as set forth in claim 2 further including a sensor module mountable within a vehicle, said sensor module including said acoustic sensor and said accelerometer.

Claim 4 (Previously presented) A system as set forth in claim 2 wherein said acoustic sensor is an omnidirectional ultrasonic sensor for sensing ultrasonic acoustic waves propagating through the vehicle structure during vehicle crash events originating in any of a plurality of directions and providing said safing signal indicative thereof.

Claim 5 (Previously presented) A system as set forth in claim 4 further including a sensor module mountable within a vehicle, said ultrasonic sensor being part of said sensor module, said accelerometer being a crush zone sensor remote from said sensor module for sensing acceleration of part of the vehicle indicative of a vehicle crash event and providing said crash signal having an electrical characteristic indicative thereof.

Claim 6 (Previously presented) A system as set forth in claim 5 wherein said crush zone sensor is a front

crush zone sensor located at a forward part of the vehicle and electrically connected with said controller, said front crush zone sensor sensing a front impact vehicle crash event in response to movement of the forward part of the vehicle and providing a front crash signal indicative thereof, said controller controlling actuation of said occupant protection device in response to both said safing signal and said front crash signal indicating the occurrence of a crash event.

 Claim 7 (Previously presented)      A system as set forth in claim 5 wherein said crush zone sensor is a side crush zone sensor located at a side part of the vehicle and electrically connected with said controller, said side crush zone sensor sensing a side impact vehicle crash event in response to movement of the side part of the vehicle and providing a side crash signal indicative thereof, said controller controlling actuation of said occupant protection device in response to both said safing signal and said side crash signal indicating the occurrence of a crash event.

Claim 8 (Previously presented)      A system as set forth in claim 1 wherein said crash sensor further includes a plurality of accelerometers, each of said plurality of accelerometers being operative to sense vehicle acceleration and provide a respective acceleration signal, said

controller controlling actuation of said occupant protection device in response to an acceleration signal from at least one of said plurality of accelerometers and said safing signal.

Claim 9 (Original) A system as set forth in claim 8 further including a sensor module mountable within a vehicle, said acoustic sensor and at least one of said plurality of accelerometers being part of said sensor module.

Claim 10 (Previously presented) A system for helping to protect a vehicle occupant, said system comprising:

a plurality of crash event sensors, each of said plurality of crash event sensors being operative to sense a different condition of the vehicle and to provide a corresponding sensor signal having a characteristic indicative of the vehicle condition sensed thereby;

an acoustic safing sensor operative to sense acoustic waves propagating through the vehicle structure during a vehicle crash event and to provide a safing signal having a characteristic indicative of the sensed crash event;

an occupant protection device for, when actuated, helping to protect the vehicle occupant during a vehicle crash event; and

a controller connected with each of said plurality of crash event sensors, said acoustic safing sensor, and said occupant protection device, said controller determining the occurrence of a vehicle crash event and controlling actuation of said occupant protection device in response to the sensor signal from any one of said plurality of crash event sensors and the safing signal from said acoustic safing sensor separately indicating the occurrence of a deployment crash event.

Claim 11 (Original) A system as set forth in claim 10 wherein each of plurality of said crash event sensors is selected from a group consisting of an accelerometer and a crush zone sensor.

Claim 12 (Original) A system as set forth in claim 10 further including a sensor module mountable within a vehicle, said acoustic sensor being part of said sensor module.

Claim 13 (Original) A system as set forth in claim 12 wherein said at least one of said plurality of crash event sensors is part of said sensor module.

Claim 14 (Previously presented) A system for helping to protect a vehicle occupant, said system comprising:

a sensor module for mounting in a vehicle, said sensor module including:

an accelerometer operative to sense vehicle acceleration and provide an acceleration signal having a characteristic indicative of the sensed vehicle acceleration; and

an acoustic sensor operative to detect acoustic waves propagating through the vehicle structure during a vehicle crash event and to provide a safing signal having a characteristic indicative of the sensed crash event;

an occupant protection device for, when actuated, helping to protect the vehicle occupant during a vehicle crash event; and

a controller which controls actuation of said occupant protection device in response to both said acceleration signal and said safing signal separately indicating the occurrence of a deployment crash event.

Claim 15 (Previously presented) A system as set forth in claim 14 wherein said sensor module further includes a plurality of accelerometers, each of said plurality of accelerometers being operative to sense vehicle acceleration and provide a respective acceleration signal indicative of the vehicle acceleration sensed thereby, said controller controlling actuation of said occupant protection device in response to the acceleration signal from at least one of said plurality of accelerometers and said safing signal from said acoustic sensor, whereby the acoustic sensor provides a safing signal for each of the plurality of accelerometers.

Claim 16 (Previously presented) A system as set forth in claim 14 further including a side crush zone sensor located at a side part of the vehicle and electrically connected with said controller, said side crush zone sensor sensing a side impact vehicle crash event in response to acceleration of the side part of the vehicle and providing a side crash signal indicative thereof, said controller controlling actuation of said occupant protection device in response to both said safing signal and said side crash signal indicating the occurrence of a crash event.

Claim 17 (Previously presented)      A method for  
controlling actuation of an actuatable occupant protection  
device of a vehicle, said method comprising the steps of:

sensing a vehicle crash condition;

providing a crash event signal having a  
characteristic indicative of the sensed vehicle crash  
condition;

sensing acoustic waves that travel through the  
vehicle structure during the occurrence of the vehicle crash  
condition;

providing a safing signal in response to the  
sensed acoustic waves during the vehicle crash condition;

determining the occurrence of a vehicle crash  
event in response to both the crash event signal and the  
safing signal separately indicating the occurrence of a  
vehicle crash condition; and


controlling actuation of an occupant protection  
device in response to said determination.

Claim 18 (Previously presented)      A method as set  
forth in claim 17 further including providing a plurality of  
crash event sensors, each of the crash event sensors sensing  
a vehicle crash condition and providing a crash event signal  
indicative of the vehicle crash condition sensed thereby,  
said step of determining a vehicle crash event further



including determining the occurrence of a vehicle crash event in response to the crash signal from at least one of the plurality of crash event sensors and the safing signal from the acoustic sensor.

Claim 19 (Original) A method as set forth in claim 18 wherein each crash sensor is an accelerometer that provides an acceleration signal indicative of vehicle acceleration.




Claim 20 (Previously presented) A method as set forth in claim 17 further including mounting a front crush zone sensor at a forward part of the vehicle, said step of sensing a vehicle crash condition including sensing a front impact vehicle crash event with the front crush zone sensor, the crash event signal being a front crash signal indicative of the sensed front impact vehicle crash event sensed by the front crush zone sensor, actuation of the occupant protection device being controlled in response to both the safing signal and the front crash signal indicating the occurrence of a crash event.

Claim 21 (Previously presented) A method as set forth in claim 17 further including mounting a side crush zone sensor at a side part of the vehicle, said step of sensing a vehicle crash condition including sensing a side

impact vehicle crash event with the side crush zone sensor, the crash event signal being a side crash signal indicative of the sensed side impact vehicle crash event sensed by the side crush zone sensor, actuation of the occupant protection device being controlled in response to both the safing signal and said the crash signal indicating the occurrence of a crash event.

Claim 22 (Previously presented)      A system for helping to protect a vehicle occupant, said system comprising:



means for sensing a vehicle crash condition and providing a crash event signal having a characteristic indicative thereof;

means for sensing acoustic waves that travel through the vehicle structure in response to the occurrence of the vehicle crash condition and providing a safing signal having a characteristic indicative of a vehicle crash event; and

control means for determining the occurrence of a vehicle crash event in response to both the crash event signal and the safing signal separately indicating the occurrence of a deployment crash event and controlling actuation of an occupant protection device in response to the determination.

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